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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/855,148

05/14/2001

Takeshi Sasaki

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11/19/2003

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,148

Applicant(s)

SASAKI, TAKESHI

Examiner

Thoi V Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1. ☒ Certified copies of the priority documents have been received.
 - 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This office action is in response to the Amendment with RCE filed September 10, 2003.

Accordingly, claims 2-4, 7 and 8 were amended, claim 1 was cancelled, and new claim 9 was added. Currently, claims 2-9 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2 and 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art in view of Shin et al. (USPN 6,086,443).

As shown in Figs. 1A, 1B, 1C, and 2, Applicant's Prior Art discloses a fabrication method of a liquid crystal display (LCD) panel 20, comprising the steps of:

forming a seal member 4 containing second spacers 5 on a TFT transparent substrate 1 such that said seal member surrounds a display area of said liquid crystal display panel;

arranging first spacers 16 on said display area on the TFT substrate;

dropping liquid crystal 3 onto an area surrounded by said seal member on the TFT substrate;

forming a panel by sticking a color-filter transparent substrate on the TFT substrate with said seal member in a vacuum chamber;

putting said panel under atmospheric pressure to deform said first spacers through a deformation of said panel due to a difference between said atmosphere pressure and a negative pressure inside said panel (Specification, paragraph 13); and

hardening said seal member after an inner volume of said panel becomes equal to a volume of said liquid crystal (Specification, paragraph 21),

wherein said first spacers are elastically deformable at first at the center portion of the panel before a gap at the seal member is deformable as shown in Fig. 1B.

Applicant's Prior Art discloses a fabrication method of a LCD panel that is basically the same as that recited in claim 1 except that the initial size of the first spacer in a cell gap direction is not larger than an appropriate cell gap of the LCD panel. As shown in Figs. 1 and 2, Shin discloses a fabrication method of a LCD panel in which spacers 4 have an initial size larger than a goal cell gap between two substrates 10 and 20 by 10-30 %, and the spacers 40 in the cell gap are compressed down compared with its uncompressed state by 10-30 % (col. 4, lines 38-42) in order to obtain a uniform cell gap for the LCD panel (col. 1, lines 58-60). Accordingly, a relative value of the initial average size of the spacers to the appropriate cell gap is by 110-130 %. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Applicant's Prior Art with the teaching of Shin by using first spacers having

initial size in a cell gap direction larger than an appropriate cell gap necessary to perform an appropriate liquid crystal display such that the first spacers are elastically deformable at first from the initial size to an appropriate cell gap before a gap at the seal member is reached to said appropriate cell gap so as to maintain an uniform cell gap of the display and hence to obtain a high display quality.

With respect to claim 2, as known in the art, plastic beads are generally used for the spacers to obtain elasticity.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art in view of Shin et al. (USPN 6,086,443) as applied to claims 2 and 4-9 above, and further in view of Hiraichi et al. (USPN 6,204,907 B1)

Applicant's Prior Art as modified in view of Shin above includes all that is recited in claim 3 except for the material of the second spacer which is hardly deformed under atmospheric pressure. Hiraishi discloses, as shown in Fig. 2, a LCD device comprising first spacers 7 which are plastic beads and second spacers which are glass beads disposed in a seal 14 to maintain the gap between a TFT substrate 10 and an opposite substrate 20 and to prevent the problem of inappropriate display in a neighborhood display of the seal 14 (col. 10, lines 16-22). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the Applicant's Prior art with the teaching of Hiraishi by having second spacers formed of a material such as glass beads, which is hardly deformed when it is pinched between the

substrates under atmospheric pressure so as to obtain a good linearity in the sealing edge and a uniform cell gap for the display.

Response to Arguments

5. Applicant's arguments filed 09/10/2003 have been fully considered but they are not persuasive.

Applicant argued that Shin et al. merely shows a liquid crystal injection method and is by no means related to the falling-drop method. And the spacers of Shin et al. have plasticity rather than elasticity. The Examiner disagrees with the Applicant's remarks since the Shin's reference is employed for teaching the spacers which have an initial larger than the appropriate cell gap and deform from the initial size when the first and second substrates are forced to compress so as to maintain a uniform cell gap (col. 3, lines 37-39). Thus, it is obvious that the teaching is applicable to the fall-drop method of the Applicant's Prior Art to form the display panel with a uniform cell gap. In addition, from Merriam Webster's Collegiate Dictionary (Tenth Edition), *elasticity* is defined as the capability of a strained body to recover its size and shape after deformation and *plasticity* is defined as the ability to retain a shape attained by pressure deformation. Accordingly, the spacers can have either elasticity or plasticity or both.

Applicant also argued that the reference Hiraishi et al. is merely cited to show the sealing portion with a spacer with no hint as to the falling-drop method. Again, the reference Hiraishi et al. is employed for teaching the spacers formed of hardly deformable material in the sealing portion such as glass beads so that

they are not deformed when they are pinched between the substrates under atmospheric pressure so as to obtain a uniform cell gap at the periphery of the substrates. Thus, it is obvious that the teaching is applicable to the fall-drop method wherein the sealing portion is formed on one of the substrates to obtain a uniform cell gap at the periphery of the substrates.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong



11/16/2003

